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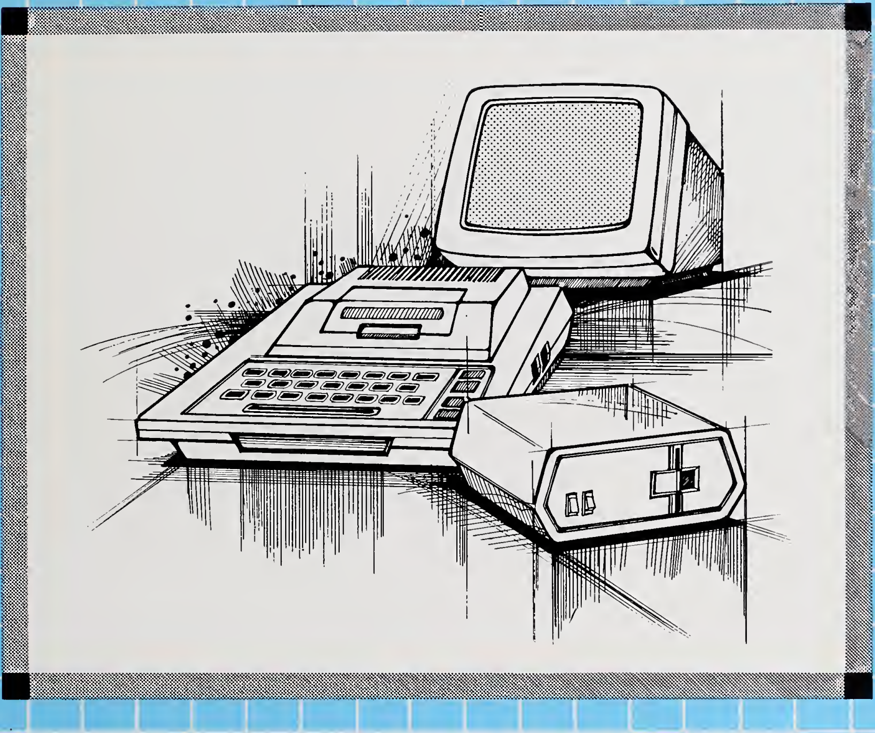
1985

BUSINESS EDUCATION CURRICULUM GUIDE

COMPUTER PROCESSING

10-20-30



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Alberta
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COMPUTER PROCESSING 10-20-30
CURRICULUM GUIDE

1985

NOTICE TO TEACHERS

This Curriculum Guide is subject to review and revision, in keeping with any revision to the Business Education curricula which may occur as a result of the Secondary Education Policy Statement, June 12, 1985.

Alberta
EDUCATION

ACKNOWLEDGEMENTS

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NOTE: This publication is a service document. The advice and direction offered is not prescriptive except where it duplicates or paraphrases the content of the Program of Studies. In these instances, the content is in the same distinctive manner as is this notice so that the reader may readily identify all prescriptive statements or segments of the document.

Mandatory implementation of the program is September, 1985.

ALBERTA EDUCATION PUBLICATIONS

The following service publications and prescriptive documents are available from Alberta Education to administrators and business education teachers.

From Curriculum Branch, Program Development Division

1. Program of Studies
2. Junior-Senior High School Handbook
3. Accounting 10-20-30 Curriculum Guide
4. Basic Business 20-30 Curriculum Guide
5. Computer Processing 10-20-30 Curriculum Guide
6. Law 20-30 Curriculum Guide
7. Marketing 20-30 Curriculum Guide
8. Office Procedures 20-30 Curriculum Guide
9. Shorthand 20-30 Curriculum Guide
10. Typewriting 10-20-30 Curriculum Guide
11. Optional (Business Education 10-20-30) Curriculum Guide
    - 11.1 Record Keeping 10
    - 11.2 Business Calculation 20
    - 11.3 Business Communication 20
    - 11.4 Dicta Typing 20
    - 11.5 Word Processing 30
12. Junior High School Typewriting Curriculum Guide, 1973
13. Accounting 10-20-30 Curriculum Implementation Manual for Teachers (published December, 1985)
14. Basic Business 20-30 Curriculum Implementation Manual for Teachers (published December, 1985)
15. Computer Processing 10-20-30 Curriculum Implementation Manual for Teachers (published December, 1985)
16. Law 20-30 Curriculum Implementation Manual for Teachers (published December, 1985)
17. Marketing 20-30 Curriculum Implementation Manual for Teachers (published December, 1985)
18. Office Procedures 20-30 Curriculum Implementation Manual for Teachers (published December, 1985)
19. Shorthand 20-30 Curriculum Implementation Manual for Teachers (published December, 1985)
20. Typewriting 10-20-30 Curriculum Implementation Manual for Teachers (published June, 1986)

From School Book Branch

1. School Book Branch Catalogue

For further information, contact Curriculum Branch (Program Development Division) or Edmonton or Calgary Regional Offices (Program Delivery Division).

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PROGRAM PHILOSOPHY

Business Education is an interdisciplinary study of the principles, procedures and technologies within the business environment and thus plays a significant role in meeting the Goals of Schooling and Goals of Education in Alberta Schools. Within this program a student has the opportunity to learn more about the role of a future participant within a productive society and to build a framework for a successful career. The knowledge, skills, attitudes and habits expected in business assist students, upon completion of high school, to respond to the opportunities and expectations of the world of work.

The development of the individual's potential in the areas of psychomotor, affective and cognitive domains is central to learning and instruction. Individuals discover themselves and realize their potential by interacting with ideas, technology and people. The world of business is an appropriate focus for this interaction.

Presented from the dual viewpoint of the individual as a consumer within the marketplace and a participant within the production cycle, the content within the Business Education Program provides for development of:

1. Skills and knowledge all citizens need to successfully participate in the business world,

2. Skills for immediate job entry, and

3. Skills and knowledge supportive of a business-related post-secondary program.

The continuum of experiences within the business education program starts with exploratory activities in junior high school and expands in scope and depth at the high school level. The program can meet the three general objectives while providing viable alternatives and challenge for students of all levels of ability and interests. The relevance of the program is further enhanced through the integration of technology and related practices throughout the program, helping prepare the student for the information age.

LEARNING PRINCIPLES

Business Education courses incorporate the following learning principles:

1. Student learning should move from the level of prior knowledge through the course objectives at a rate governed by the students' aptitude and attitude. Learning will be maximized in environments where student initiative is encouraged and the learning environment is non-threatening and considered relevant to the learner.

2. Since students learn in different ways, a variety of methodologies and presentations should be used to meet the various learning styles of the individual. Presenting content in a variety of contexts reinforces the students's ability to apply the concept in a variety of circumstances and in an appropriate manner.

3. Personal learning goals should reflect the broader objectives of the program. Establishing a learning environment wherein self-analysis and personal evaluation are promoted encourages confidence, decision making, self-motivation, and critical thinking skills.

4. Skills development is promoted through appropriately structured learning experiences which may or may not include necessary repetition and the application of tasks that are relevant to future experiences. Development of skills is only part of the learning process. Students must understand when and how to apply these skills.

5. Establishing opportunities for success and building on the positive influence of rewards develops self confidence and motivation.

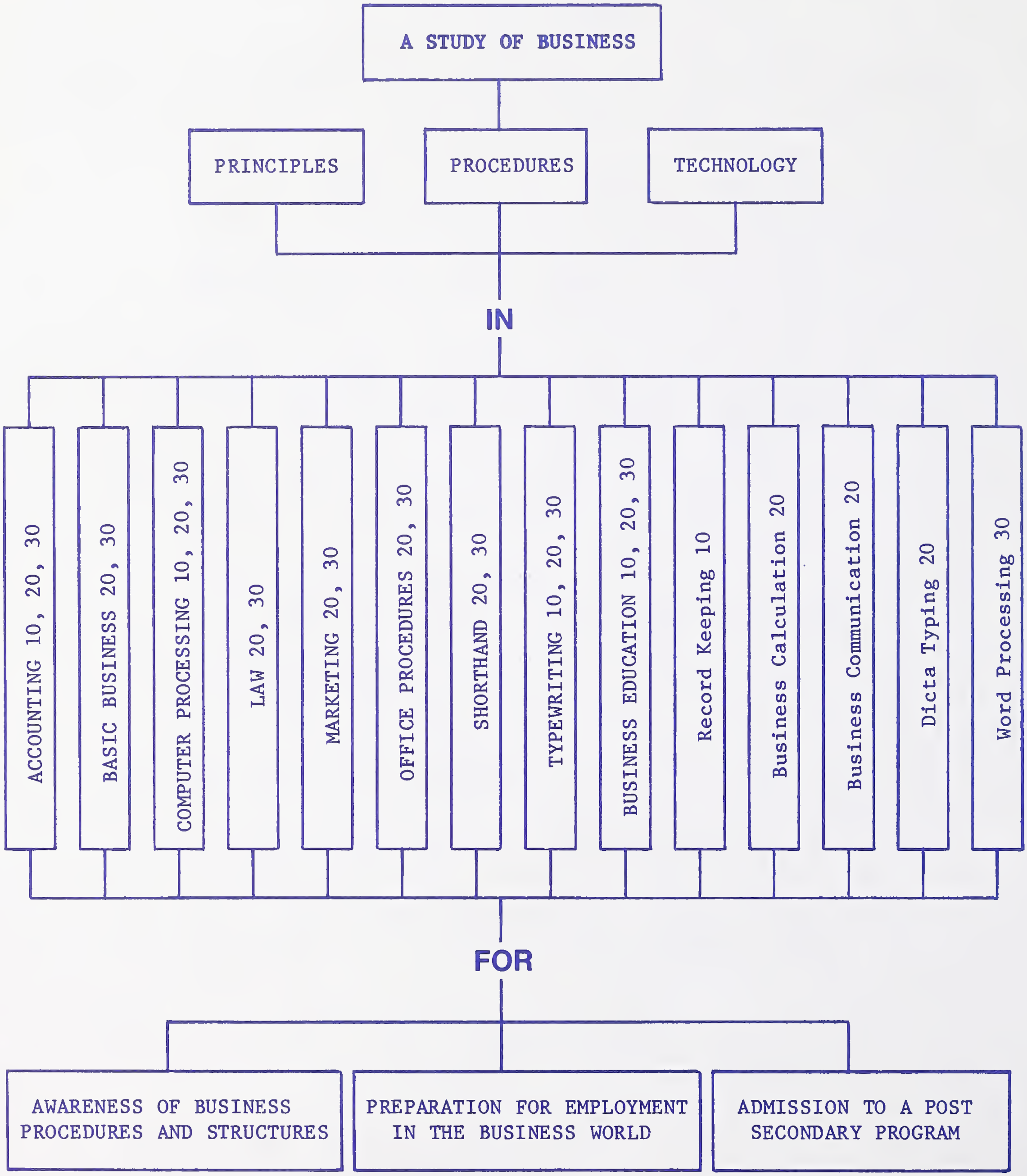
PROGRAM OBJECTIVES

Senior High School

The business education curriculum provides education ABOUT business for ALL students in order that they become informed citizens, and education FOR business for SOME students in order that they become effective workers. More specifically, the purpose of the program is:

1. To provide a meaningful study of the business environment including the ideas, people, and technology of business.
2. To provide for the development and acquisition of business knowledge and skills which will be most useful and durable in a rapidly changing society.
3. To provide an opportunity for students to elect and pursue individual interests and specialization in the study of the business environment.
4. To develop acceptable communication and interpersonal skills.
5. To develop the thinking strategies and problem-solving abilities of students.
6. To provide an opportunity for students to relate and apply learnings in business education to other areas of study.
7. To expose students to the business environment for the purpose of acquiring information, gaining experience and testing ideas and hypotheses.
8. To provide for a general understanding of business and the development of skills for personal use.
9. To provide background skills and knowledge for specialization in business and/or admission to post-secondary programs.
10. To prepare for job entry upon completion of high school and for future advancement in business.

SCHEMATIC OVERVIEW OF PROGRAM



COURSE SEQUENCES

Courses listed on the same line and to the left indicate a prerequisite. The maximum credits available to a student for use on a high school diploma is shown in the left column. Whether the course may be offered for 3 and/or 5 credits is shown in brackets following the course name. Some courses have additional prerequisites. These are indicated with solid lines.[1]

Maximum Credits			
13	1501 Accounting 10 .... (3)(5)	2501 Accounting 20 .... (3)(5)	3500 Accounting 30 .... (5)
15[3]	1527 Computer Processing 10 .... (3)(5)	2527 Computer Processing 20[2]........ (3)(5)	3527 Computer Processing 30 .... (3)(5)
10		2541 Basic Business 20 .... (3)(5)	3541 Basic Business 30 .... (3)(5)
30	1542 Business Education 10 ...... (3)(5)(10)	2542 Business Education 20 ..... (3)(5)(10)	3542 Business Education 30 ...... (3)(5)(10)
3	1550 Record Keeping 10 .... (3)		
3		2566 Dicta Typing 20 .... (3)	
15	*1565 Typewriting 10 .... (3)(5)	2565 Typewriting 20 .... (3)(5)	3565 Typewriting 30 .... (5)
3			3567 Word Processing 30 .... (3)
10		2555 Shorthand 20 .... (3)(5)	3555 Shorthand 30 .... (3)(5)
10		2545 Office Procedures 20 .... (3)(5)	3545 Office Procedures 30 .... (3)(5)
3		2543 Business Communication 20 .... (3)	
3		2544 Business Calculation 20 .... (3)	
10		2430 Law 20 .... (3)(5)	3430 Law 30 .... (3)(5)
10		2540 Marketing 20 .... (3)(5)	3540 Marketing 30 .... (3)(5)

[1] Please refer to the BUSINESS EDUCATION MANUAL FOR ADMINISTRATORS, COUNSELLORS, AND TEACHERS for criteria for module selection.

* Typewriting 10 is required for Dicta Typing 20; Typewriting 20 is required for Word Processing 30, Shorthand 30, and Office Procedures 30.

[2] Computer Literacy 10 may be used as an alternate prerequisite to Computer Processing 20.

[3] A student can take Computer Literacy 10 or Computer Processing 10, followed by Computer Processing 20 and then Computer Processing 30. However, the maximum number of credits available to a student in Computer Literacy and Computer Processing is fifteen (15).

GUIDELINES FOR STRUCTURING BUSINESS EDUCATION COURSES

GENERAL GUIDELINES

The structure of the business education program allows schools to design courses to meet the specific needs of the students in that school. The content has been organized into sequenced and unsequenced modules organized under the following eight main subject areas or strands.

1. Accounting 10, 20, and 30
2. Basic Business 20 and 30
3. Computer Processing 10, 20, and 30
4. Law 20 and 30
5. Marketing 20 and 30
6. Office Procedures 20 and 30
7. Typewriting 10, 20, and 30
8. Shorthand 20 and 30

Subject to the constraints outlined in the curriculum guides, modules are to be formatted into 3- or 5-credit courses within each strand. Schools or school jurisdictions should designate 3 modules for a 3-credit course and 5 modules for a 5-credit course. The optional strand modules may be used to enhance the subject area strands or, alternatively, combined to form 3-credit courses.

The program to be offered should be established through consultation of teaching, guidance, and administrative personnel. In order to promote consistency between grade levels and establish appropriate standards for student evaluation, jurisdictions may wish to monitor the selection of modules. Care should be taken to ensure that students' programs do not repeat modules.

Course sequences are outlined in the yearly-published *Junior-Senior High School Handbook*. These course sequences are also listed on page 8. For further information regarding module sequences and equipment requirements, refer to the specific modules within the curriculum guides and/or the *Business Education Manual for Administrators, Counsellors, and Teachers*.

BUSINESS EDUCATION 10, 20, AND 30

In addition to or as an alternative to the courses designated under the subject strands, (i.e., Typewriting 20, Law 30, etc.) 3, 5, or 10 credits may be offered in each of Business Education 10, 20, and 30 to a maximum of 30 credits. Business Education 10, 20, or 30 courses are created by selecting a number of modules from the eight main subject strands as well as from the *Optional* strand. Elective modules within the subject strands may only be selected if students have taken the core modules identified in the strands. Business Education 10, 20, and 30 courses are sequential.

MINI COURSES

As an alternative to using the modules in the Optional strand to enhance subject area courses, modules from the Optional strand may be grouped together to form 3-credit courses as follows:

Record Keeping 10 - (1) Record Keeping 1
(2) Record Keeping 2
(3) Record Keeping 3

Business Calculation 20 - (4) Business Calculation 1
(5) Business Calculation 2
(6) Business Calculation 3

Business Communication 20 - (7) Business Communication - Development
(8) Business Communication - Practice
(9) Business Communication - Integration

Dicta Typing 20 - (12) Dicta Typing 1
(13) Dicta Typing 2
(16) Business Simulation

Word Processing 30 - (14) Word Processing 1
(15) Word Processing 2
(16) Business Simulation

ENHANCEMENT: Use of Optional Modules

A subject strand course may be enhanced by including a module or modules from the Optional strand that supports the objective for a particular course. Inclusion of modules from subject strands other than Optional is not permissible. Not more than one Optional module may be included at each grade level in a 3-credit course, and not more than two optional modules may be included at each grade level in a 5-credit course. The Business Research and Business Simulation modules may, however, be used once in each subject strand provided that the topic is not duplicated. The Optional strand modules are:

1. Record Keeping 1
2. Record Keeping 2
3. Record Keeping 3
4. Business Calculation 1
5. Business Calculation 2
6. Business Calculation 3
7. Business Communication - Development
8. Business Communication - Practice
9. Business Communication - Integration
10. Business Research Project
11. Goal Setting and Career Development
12. Dicta Typing 1
13. Dicta Typing 2
14. Word Processing 1
15. Word Processing 2
16. Business Simulation

MATRIX

SUBJECT STRANDS

(13)* ACCOUNTING		
C	1.	Basic Accounting Concepts
C	2.	Journalizing and Posting
C	3.	Completing the Accounting Cycle
C	4.	Merchandise Accounting
C	5.	End-of-Year Adjustments & 8-Column Worksheets
E	6.	Optional Accounting Tasks
E	7.	Voucher System and End-of-Year Adjustments
E	8.	Departmentalized Tasks
E	9.	Partnership and Corporation Accounting
E	10.	Cost Accounting
E	11.	Financial Analysis
E	12.	Accounting Simulation I
E	13.	Accounting Simulation II: Computerized Accounting

(10)* BASIC BUSINESS			
BB 20	C	1.	Canadian Business
	C	2.	Consumer Credit
	C	3.	Insurance
BB 30	C	4.	Economic Concepts
	C	5.	Small Business Management I
	C	6.	Management Techniques
ELECTIVE	E	7.	Personal Financial Planning
	E	8.	Small Business Management II (Simulation)

(15)* COMPUTER PROCESSING		
C	1.	Computer Information Systems
E	2.	Overview of Software
E	3.	Applications: Data Entry
E	4.	Applications: Word Processing
E	5.	Applications: Computer Simulations
E	6.	Applications: Data Base
E	7.	Applications: Electronic Spread Sheet
E	8.	Overview of Introductory Programming Language
E	9.	Fundamentals of Input/Output
E	10.	Introduction to Advanced Computer Programming Techniques
E	11.	Advanced Computer Programming Techniques
E	12.	Extended Programming Project
E	13.	Introduction to Second Programming Language
E	14.	Applications in Second Programming Language
E	15.	Extended Project in Second Programming Language
E	16.	Graphics
E	17.	Systems Analysis and Program Development
E	18.	Machine/Assembly Language

(10)* LAW			
LW 20	C	1.	Nature of Law and the Civil Law System
	C	2.	Contract Law
	C	3.	Family Law
LW 30	C	4.	Basic Rights and Responsibilities
	C	5.	Labour Law
	C	6.	Property Law
ELECTIVE	E	7.	Criminal Justice System
	E	8.	Consumer Law
	E	9.	Tort Law
	E	10.	Controversial Issues

(10)* MARKETING			
MK 20	C	1.	World of Marketing
	C	2.	Advertising and Sales Promotion
	C	3.	Distribution of Goods and Services
MK 30	C	4.	Marketing Research
	C	5.	Pricing and Financial Activities
	C	6.	Selling
ELECTIVE	E	7.	Display
	E	8.	Purchasing & Controlling Merchandise

(10)* OFFICE PROCEDURES		
C	1.	Structure of the Business Office
E	2.	Personnel in the Business Office
E	3.	Business Communication
E	4.	Records Management
E	5.	Information Processing
E	6.	Clerical Routines
E	7.	Secretarial Routines
E	8.	Office Specialties I
E	9.	Office Specialties II
E	10.	Office Simulation

(10)* SHORTHAND		
C	1.	Shorthand Theory 1
C	2.	Shorthand Theory 2
C	3.	Shorthand Theory 3
E	4.	Shorthand Theory, Dictation & Transcription 1
E	5.	Shorthand Theory, Dictation & Transcription 2
E	6.	Speed & Transcription Skill Building 1
E	7.	Speed & Transcription Skill Building 2
E	8.	Speed & Transcription Skill Building 3
E	9.	Speed & Transcription Skill Building 4
E	10.	Speed & Transcription Skill Building 5

(15)* TYPEWRITING		
C	1.	Keyboarding
C	2.	Keyboarding, Centering and Tabulation
C	3.	Letters and Essays
C	4.	Reports
C	5.	Letters & Tables
C	6.	Manuscripts
C	7.	Tables, Business Forms & Financial Reports
C	8.	Business Correspondence
E	9.	Specialized Prod. Applications
E	10.	Production Projects & Review
E	11.	Professional Applications I
E	12.	Professional Applications II
E	13.	Simulation I
E	14.	Simulation II

OPTIONAL

OPTIONAL

Subject to restrictions noted in the curriculum guides, these optional modules may be used to enhance the subject strand courses.

1. Record Keeping 1
2. Record Keeping 2
3. Record Keeping 3
4. Business Calculation 1
5. Business Calculation 2
6. Business Calculation 3
7. Business Communication — Development
8. Business Communication — Practice
9. Business Communication — Integration
10. Business Research Project
11. Goal Setting and Career Development
12. Dicta Typing 1
13. Dicta Typing 2
14. Word Processing 1
15. Word Processing 2
16. Business Simulation

MINI COURSES

(3)* RECORD KEEPING 10	(3)* BUSINESS CALCULATION 20	(3)* BUSINESS COMMUNICATION 20
C 1. Record Keeping 1	C 1. Business Calculation 1	C 1 Business Communication — Development
C 2. Record Keeping 2	C 2. Business Calculation 2	C 2. Business Communication — Practice
C 3. Record Keeping 3	C 3. Business Calculation 3	C 3. Business Communication — Integration

(3)* DICTA TYPING 20	(3)* WORD PROCESSING 30
C 1. Dicta Typing 1	C 1. Word Processing 1
C 2. Dicta Typing 2	C 2. Word Processing 2
C 3. Business Simulation	C 3. Business Simulation

BUSINESS EDUCATION 10-20-30

(30) BUSINESS EDUCATION 10-20-30
Modules from any of the 8 subject strands, and/or the Optional strand may be combined to form three, five or ten credit courses at the 10, 20 or 30 level. The courses are sequential. Elective modules may only be included in a program when core modules have been completed. Care should be taken to ensure that student programs do not duplicate modules.

***Refers to maximum credits available.**

Note: Core modules are prerequisite to elective modules.

Code: C — Core
E — Elective

COMPUTER PROCESSING 10-20-30

Introduction

Computer Processing is designed to provide all students with an opportunity to study the impact of the computer on the individual and society. Programming and software manipulation should provide the student with an opportunity to personally direct the power of the computer to solve simple to complex problems.

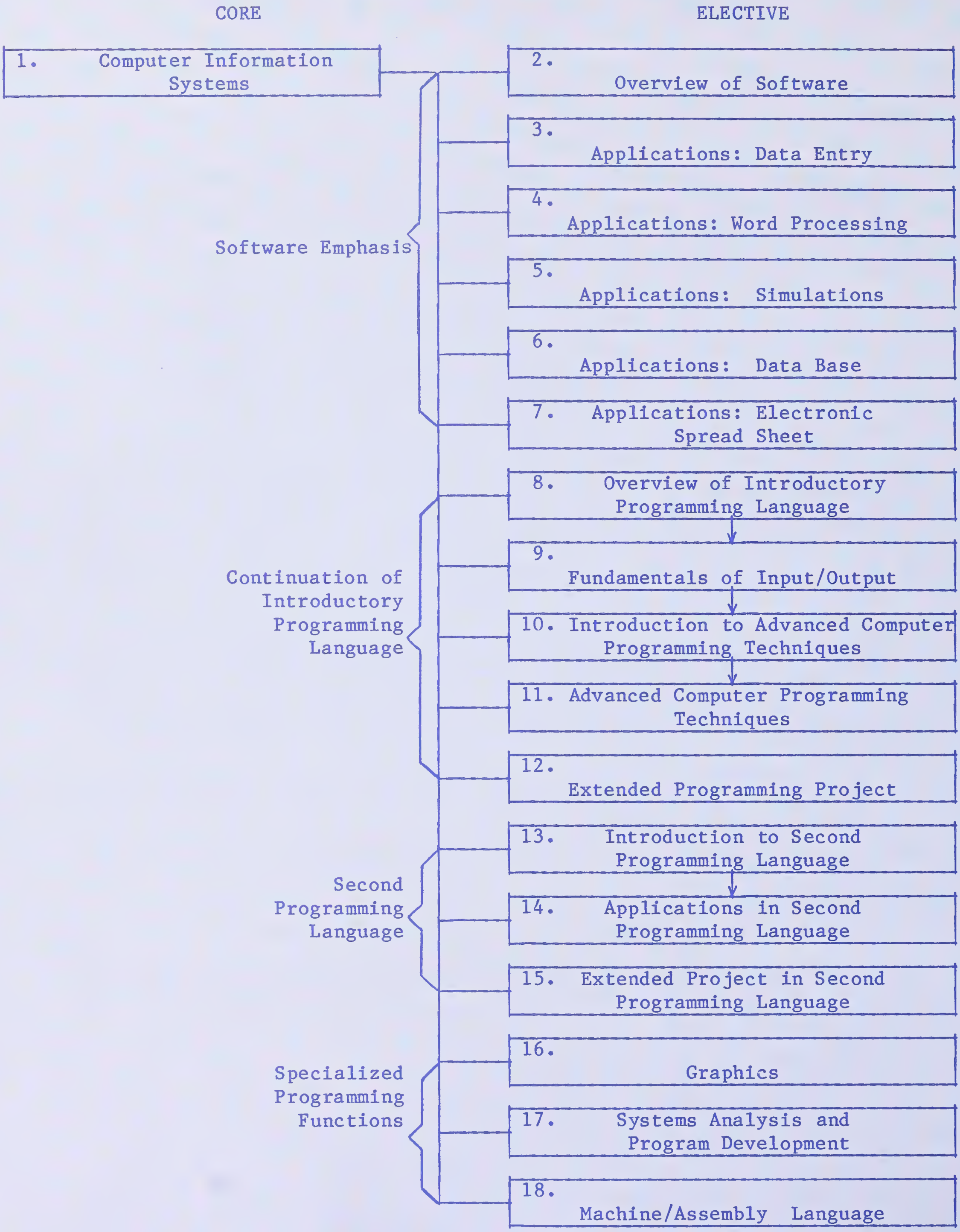
The skills and knowledge developed will be applicable to all disciplines. Students have the opportunity to develop basic skills for the personal use of the computer, skills that support their career plans, or skills that provide suitable background for further post-secondary study.

Objectives

The student will:

1. Examine the fundamental terminology, equipment procedures, and concepts used in a computerized environment.
2. Develop the ability to use the computer to help solve problems, manipulate data, and draw inferences from data.
3. Examine the potential of computers in personal and professional activities.
4. Become adept at the manipulation of hardware and software as preparation for career or personal use.
5. Develop expertise in efficient programming techniques and program design.
6. Become aware of the potential for computer-based communications.
7. Recognize the impact of computers on productivity and career paths.

FLOWCHART OF MODULES


CORE
ELECTIVE
1. Computer Information Systems
2. Overview of Software
3. Applications: Data Entry
4. Applications: Word Processing
5. Applications: Simulations
6. Applications: Data Base
7. Applications: Electronic Spread Sheet
8. Overview of Introductory Programming Language
9. Fundamentals of Input/Output
10. Introduction to Advanced Computer Programming Techniques
11. Advanced Computer Programming Techniques
12. Extended Programming Project
13. Introduction to Second Programming Language
14. Applications in Second Programming Language
15. Extended Project in Second Programming Language
16. Graphics
17. Systems Analysis and Program Development
18. Machine/Assembly Language
Software Emphasis
Continuation of Introductory Programming Language
Second Programming Language
Specialized Programming Functions

Notes On Course Implementation

NOTE: Although Computer Processing 10-20-30 courses are in the business education program, the core and elective components form a foundation of basic computer skills and understandings that may be extended into other subject areas.

Many of the applications included in the program complement topics in other subject areas such as: graphics (mathematics), simulations (science), and word processing (language arts).

Suggestions in this regard are presented in the TEACHING NOTES of this document and in the TEACHING STRATEGIES in the COMPUTER PROCESSING CURRICULUM IMPLEMENTATION GUIDE FOR TEACHERS.

Computer Processing has 18 modules, 1 core and 17 elective. Courses of 3 or 5 credits (3 or 5 modules) may be developed at the 10, 20 and 30 levels to a maximum of 15 credits. Courses will need to be scheduled in an appropriately equipped computer lab. The recommended minimum ratio is two students to one machine.

Modules 2-7 deal with software applications. Module 8 may be used to review introductory programming concepts introduced in other courses. Programming is continued in Modules 9-12, and second-language programming in Modules 13-15. Modules 16, 17, and 18 introduce specialized aspects of computer processing.

Modules from the Optional strand may be integrated into Computer Processing if not used previously within a student's program. It is recommended that a choice be made from the following Optional modules:

Module No. 10. Business Research Project
11. Goal Setting and Career Development
14. Word Processing 1
16. Business Simulation

Some modules may have prerequisites and equipment requirements. Computer Literacy 10 may be used as an alternative prerequisite to Computer Processing 20. Refer to individual modules for further information.

MODULE 1: COMPUTER INFORMATION PROCESSING

Status: CORE

Purpose: To make the student aware of the terminology and concepts applied to information processing systems.

TOPIC	LEARNING TASKS	TEACHING NOTES
	The student will:	
Evolution of Data Processing	list some of the major events that led to demands for data processing systems and equipment	
	discuss the benefits of information sharing by individuals, groups, societies, governments, and business	
	describe the transition from manual to mechanical to electronic data processing systems	
Terminology	define terms relative to basic data processing functions, cycles, and systems	
Characteristics of Information Systems	define and distinguish between various information systems	data processing systems, management information systems, decision support systems, file processing systems
	identify functions of information systems	data capture, file creation, file updating, report writing, file inquiry
	describe basic data processing functions	record, classify parts, calculate, summarize, compare, communicate, sort and retrieve
	review the life cycle of an information system	
	identify the problems that may occur when converting to a computerized information system	
	describe characteristics of computer information systems	data entry, computer operations, media library, data control, production control, technical support, systems programming, data administration, data security and contingency planning

TOPIC	LEARNING TASKS	TEACHING NOTES
Information Processing Environment	discuss logical organization of data flow	refer to Appendix C of Computer Processing Curriculum Implementation Manual for Teachers
	identify interrelatedness of hardware, software, and firmware	
	discuss the various operating systems	ProDOS, MSDOS, CPM
	discuss the functions and types of software systems	job management, data management, processing control, communications, scheduling, security, performance monitors
	identify computer peripherals	micro, mini, main frame computers
	compare size, cost effectiveness, and capacity of computer installations	
Data Communications	describe the types of data communications and the methods by which data can be transmitted	
	describe functional components of a data communications network	terminal, encoder/decoder, communications channel, receiver
	define and distinguish between levels of data communications service	remote job entry, on-line data entry, on-line inquiry, real time processing, interactive operations and load sharing
	describe the basic types of data communications networks	rings, point-to-point and switching
Issues and Trends	discuss safeguarding privacy of data	authorized access, confidentiality, liability of computer professionals
	distinguish between integrity of data and reliability of data	
	discuss the ethical and legal restrictions of computer use	
	discuss trends in computerized information systems	robotics, artificial intelligence, electronic communication

MODULE 2: OVERVIEW OF SOFTWARE

Status: Elective
Prerequisite: Module 1

Purpose: To demonstrate and use commercially-prepared software packages.

Recommendation: While a minimum of 75 percent of instructional time should be spent using software packages, students should develop an understanding of the relationship of the software to the management of information and decision-making.

TOPIC	LEARNING TASKS	TEACHING NOTES
	The student will:	
Terminology	appropriately use terms related to hardware and software	Suggested Types of Software 1. Utility - diagnostic - format - copy and back-up - data recovery - operating system conversion 2. Applications - word processing - electronic spread sheets - data base management - accounting 3. Simulations 4. Drill and Practice 5. Computer Assisted Instruction 6. Authoring Systems
Legal Constraints to Use of Software	adhere to the legal constraints imposed by copyright	
Proper Handling Techniques	demonstrate proper handling and storage techniques for software	
	evaluate the documentation available for the software	
	discuss limitations and potential of a particular piece of software	
Types of Software	distinguish between the various types of software	computer-assisted instruction, and interactive software
	identify supporting hardware configurations required to operate various software packages	memory peripherals
	discuss the relationship of hardware and software	embedded software, firmware 1. size and type of storage (internal [RAM]); (external [disks]) 2. memory 3. peripherals 4. operating systems
Software Applications	develop awareness of the wide range in quality of commercially-prepared software	
	describe some of the basic criteria for software evaluation	
Software-Use Procedure	demonstrate use of commercially-prepared and/or locally-authored software	
	use selected software packages for a variety of efficient problem-solving applications	

MODULE 3: APPLICATIONS: DATA ENTRY

Status: Elective
Prerequisite: Module 1

Purpose: To enable the student to develop skill in coding, keying data, manipulating data, and generating reports.

Recommendation: While a minimum of 75 percent of instructional time should be spent using software packages, students should develop an understanding of the relationship of the software to the management of information and decision-making.

Note: Computer must be equipped with 10-key number pad.

TOPIC	LEARNING TASKS	TEACHING NOTES
	The student will:	
Data Entry Functions	discuss the advantages of computerized data manipulation differentiate between the data entry function and other forms of data input develop awareness of the career opportunities using data entry skills	
Coding Data	work efficiently with source documents	identify records, fields and codes using accounting software, research data, raw scones, invoices, time cards, payroll, inventory, vouchers
Data Entry	develop touch techniques in alphabetic and numeric data input	keyboarding software data entry software
	develop keyboard editing skills	word processing software
	increase entry speed and accuracy through numeric and alphanumeric drills	
	demonstrate the importance of efficient, accurate handling of data entry tasks	
	demonstrate the ability to code source documents appropriately	
Generating Reports	produce reports and summaries	

MODULE 4: APPLICATIONS: WORD PROCESSING

Status: Elective
Prerequisite: Module 1

Purpose: To enable the student to learn the procedures of and develop skill in word processing.

Recommendation: While a minimum of 75 percent of instructional time should be spent using software packages, students should develop an understanding of the relationship of the software to the management of information and decision-making. Students should be able to demonstrate touch-type keyboard skills.

TOPIC	LEARNING TASKS	TEACHING NOTES
	The student will:	
Introduction to Information Processing	discuss word processing terms and functions describe the advantages of electronic word processing differentiate between dedicated word processors and multi-function information processors discuss career opportunities available in word processing	reinforce efficient use of software and hardware
Software Commands	identify functions available within software package use software package documentation demonstrate integrated word processing skills through production of mailable materials discuss the limitations of the software program and hardware configuration	
Input/Output	input data using appropriate keyboard skills and function keys output information on disk, screen and printer use editing and text manipulation commands demonstrate ability to format documents	

MODULE 5: APPLICATIONS: COMPUTER SIMULATIONS

Status: Elective
Prerequisite: Module 1

Purpose: To enable the student to use the computer and appropriate software in problem-solving.

Recommendation: Topics may be selected from any subject area or may be suggested by students.

TOPIC	LEARNING TASKS	TEACHING NOTES
	The student will:	
Define Simulation	develop parameters for the simulation focus on an intended outcome (solution to the problem) establish a plan and timeline to support the solution of the problem identify necessary hardware/software	Instructors should ensure that students are working from a well-defined conceptual model and that the simulation reflects the philosophical nature of the subject from which the topic is drawn.
Focus on Topic(s) within Subject Area, OR Overview Topics from Several Content Areas, OR Develop an Approved Topic of Particular Interest.	select from such simulations as: Accounting Simulation 1. business cycles analysis 2. financial analysis 3. accounts receivable/accounts payable 4. practice sets 5. general ledger, trial balance 6. inventory control 7. job cost/payroll 8. depreciation 9. interest calculations 10. income statements/balance sheets Marketing Simulations 1. buying merchandise for resale 2. inventory control 3. discounts 4. pricing -- markups/markdowns 5. profit and loss statements 6. sales analysis 7. payroll calculations Business Management Simulation 1. taxation 2. stocks and bonds 3. interest calculations 4. business statistics 5. business economics	

TOPIC	LEARNING TASKS	TEACHING NOTES
	Biology Simulations 1. genetics 2. ecosystems 3. biological cycles 4. classification systems 5. molecular biology 6. cellular biology 7. population models 8. reproduction	
	Chemistry Simulations 1. kinetic molecular theory 2. chemical equilibria 3. reaction rates 4. spectroscopy 5. atomic models 6. molecular bonding 7. radiation chemistry 8. quantitative analysis 9. polymers 10. titration	
	Physics Simulations 1. Newtonian mechanics 2. conservation laws 3. Quantum mechanics 4. relativity 5. astronomy 6. thermodynamics 7. nuclear models 8. electromagnetic radiation 9. waves, light, and sound 10. field theory	
	Mathematics 1. solving simultaneous equations 2. graphing systems of equations 3. permutations and combinations 4. maxima and minima 5. statistics	
	Business Mathematics 1. payroll calculations 2. interest calculations 3. mortgage 4. investments 5. banking 6. pricing 7. taxes	
Evaluate the Simulation	assess the effectiveness of the simulation make recommendations as to how the simulation could have been improved relate and compare the simulation to real-life situations	

MODULE 6: APPLICATIONS: DATA BASE

Status: Elective
Prerequisite: Module 1

Purpose: To develop an understanding of and skill in manipulation of data base information systems.

Recommendation: If equipment for telecommunication is available, demonstrations or "hands-on" opportunities are recommended. Topics may be selected from any subject area or may be suggested by students. While a minimum of 75 percent of instructional time should be spent using software packages, students should develop an understanding of the relationship of the software to the management of information and decision-making.

TOPIC	LEARNING TASKS	TEACHING NOTES
	The student will:	
Management of Information	determine the most effective manner in which information should be organized	
	discuss the implications of access to information	ethics security confidentiality
Parts of Data Bases	organize information in terms of character fields, records, files, and data bases	fields-record-files
	discriminate among value, string and control characters	
	categorize data by function of field	text, numeric, key, constant, summary, and data fields
	explain relative strengths of sequential, random access, and indexed files	
Classification of Data Bases	describe structure of data bases	network, relational, schema, sub-schemas
	classify data bases in terms of kind of information	numeric, alphanumeric, representational, bibliographic
	classify data bases in terms of purpose	reference or source
	classify data bases in terms of goals	problem-oriented, discipline-oriented, commercial
	classify data bases in terms of informational category	Science and Technology; Business and Finance; Humanities; General Information
Use of Data Base Management Software	establish a record layout	
	format and label fields by type and length	
	create a file forming a number of records	
	add records to an established file	
	update a record	

TOPIC	LEARNING TASKS	TEACHING NOTES
	remove records from a file	
	add, delete, and change fields in the layout	
	locate records containing various strings of characters forming part and forming all of a field through searching a file	
	format a report	design report to access different fields and to use different layouts
Data Integration	describe how to integrate files	word processing software, an electronic spread sheet, a high level language, and/or another data base management system
Data Transfer	define the equipment requirements for data transfer	
	explain and set communications parameters	baud rate, parity, stop bits, half or full duplex
	compare a dumb terminal and a smart terminal	
	describe how to download files from a remote (online) data base to some permanent electronic storage medium (e.g., disk)	
	describe how to upload files to a remote terminal via telephone and/or radio transmission	
	explain procedures and discuss potential for electronic mail	
Telecommunications	explain various ways data can be transferred	radio, satellite, television, telephone
Commercial Data Bases	discuss the advantages and disadvantages of accessing external data bases	
	identify the features of available public/commercial data bases	
	compare on-line public/commercial data bases and locally developed data bases	

MODULE 7: APPLICATIONS: ELECTRONIC SPREAD SHEET

Status: Elective
Prerequisite: Module 1

Purpose: To develop an understanding of and skill in the use of electronic spread sheet systems.

Recommendation: While a minimum of 75 percent of instructional time should be spent using software packages, students should develop an understanding of the relationship of the software to the management of information and decision-making.

TOPIC	LEARNING TASKS	TEACHING NOTES
	The student will:	
Management of Information	determine the most effective manner in which information should be organized	
	discuss the implications of open and restricted access to information	ethics security confidentiality copyright
Use of Spread Sheets	compare electronic and manual spread sheets	paper = computer display (CRT) pencil = cursor, keyboard calculator = microcomputer
	demonstrate correct procedures for basic software functions	cursor movement entering and editing data formatting saving and recalling data files
	demonstrate correct procedures for advanced software functions	creating templates splitting the screen locking titles
	change the screen display	global or column formatting making the screen easier to read splitting the screen instant calculation
	produce hard copy of spreadsheets	
	identify formula used within the spread sheets	
	demonstrate greater sophistication in use of the spread sheet	identifying errors and information that are not available saving part of a screen look up information for comparisons
	demonstrate appropriate logic commands and mathematical functions	

TOPIC	LEARNING TASKS	TEACHING NOTES
Spread Sheet Applications	identify uses of an electronic spread sheet	home - personal cheque book, family monthly expenditure report business - balance sheets industry - projections, budgeting
	use models (templates) to enter data for several applications	forcasting sports statistics cash flow lab data financial statements financial ratios economic order quantity breakeven analysis
	use pre-formatted models to solve specific problems	
	experiment by manipulating the model to obtain a predetermined objective	
	prepare reports anticipating future trends	
	explain and demonstrate how a primary cell can be referenced by other cells within a model (template)	program recalculates the entire model based on the value just changed
	design a model for a specific application	

MODULE 8: OVERVIEW OF INTRODUCTORY PROGRAMMING LANGUAGE

Status: Elective
Prerequisite: Module 1

Purpose: To reinforce problem-solving techniques through development of structured programming skills.

Recommendation: "Hands-on" experience should account for approximately 80 percent of the time spent on this module.

TOPIC	LEARNING TASKS	TEACHING NOTES
	The student will:	
Terminology	demonstrate appropriate application of relevant computer-related terms	
Hardware	demonstrate the correct use of the various parts of the computer work station	organization of materials, disk, equipment handling
	explain the input/output and process functions with respect to the computer work station	
	demonstrate proper procedures for using the computer and the peripherals	
Software	demonstrate proper use of program manipulation DOS and system commands	load, save, edit programs
	output program to disk, screen and printer	
Programming Techniques	design, edit, and run programs using elementary input, output, assignment, and repetition commands	for example in BASIC: RUN, LIST, REM, PRINT, READ/DATA, RESTORE, IF/THEN, GOTO, PRINT, INPUT, FOR/NEXT, STEP
	incorporate format commands to control output on CRT and printer	
	use looping and branching commands efficiently	
	identify and manipulate variables	
Programming Applications	code, debug, run, and document programs	

MODULE 9: FUNDAMENTALS OF INPUT/OUTPUT

Status: Elective
Prerequisite: Modules 1 and 8

Purpose: To increase understanding of types of processing communication networks, and to develop additional programming skills, using arrays and functions.

Note: This module may appropriately involve specific applications in subject areas such as science, mathematics, technology, and fine arts. The design and expectations for projects should reflect these specific applications.

TOPIC	LEARNING TASKS	TEACHING NOTES
	The student will:	
Input/Output Processes	compare and contrast input and output devices and procedures	
	explain the difference between batch processing or interactive processing systems; multi-programming (multi-tasking) and multi-processing	
	prepare and edit data for input	
	list recent technological developments in input and output	
	produce acceptably formatted output on various devices	
Processing of Data	describe the manner in which the central processing unit manipulates and stores data	
Arrays	write programs incorporating single and double subscripted variables	program using bubble sort
	use table handling and searching techniques to manipulate data and to solve problems	
Library and Operating System Functions	utilize various library and machine functions available (arithmetic and string functions)	
Programming Applications	write programs to solve various problems	design, flowchart, code, test, debug, run
Data Communications	describe various types of data communication networks	

MODULE 10: INTRODUCTION TO ADVANCED COMPUTER PROGRAMMING TECHNIQUES

Status: Elective
Prerequisite: Modules 1 and 9

Purpose: To further develop programming techniques and to refine skill in graphics programming.

TOPIC	LEARNING TASKS	TEACHING NOTES
	The student will:	
Numbering Systems	convert numeric symbols into other numbering systems	decimal, binary and hexidecimal
"Professional" Programming Techniques	write programs that employ "professional" techniques found within the various commercially-prepared software packages review the principles of programming techniques and applications identify the limitations of the programming	structured (modular) error trapping documentation
Subroutines	examine and employ various hardware dependent and user-defined subroutines apply these subroutines in specific problem-solving activities	peek, poke
Multiple Dimension Arrays	use data arrangements such as tables, matrices and arrays involving multiple subscripts to organize information	
Introduction to Graphics	explain the difference between high-resolution and low-resolution graphics employ graphic techniques and capabilities as enhancement in the creation of programs design output utilizing the graphics capabilities of the microcomputer	text and graphics screens and windows

MODULE 11: ADVANCED COMPUTER PROGRAMMING TECHNIQUES

Status: Elective
Prerequisite: Modules 1 and 10

Purpose: To develop advanced computer programming skill through the study of file manipulation techniques.

TOPIC	LEARNING TASKS	TEACHING MOTES
	The student will:	
Types of Files	identify the various types of files	random access, sequential, indexed ASCII (text), binary, program files
	differentiate the uses of the various types of files	
	discuss the dependence of files to specific hardware configurations	
	identify various data structures	linked list, binary trees
File Handling Procedures	create examples of each type of file	
	write programs which include one or more types of files	
	manipulate information using the various types of files	
	generate output using the various types of files	

MODULE 12: EXTENDED PROGRAMMING PROJECT

Status: Elective
Prerequisite: Modules 1 and 8

Purpose: To allow the student the opportunity to increase programming skills through a project.

Recommendation: Students who have completed Modules 8, 9 and 10 will be better prepared to meet the objectives of this unit.

TOPIC	LEARNING TASKS	TEACHING NOTES
	The student will:	
Develop a Plan	develop a plan for a project that will require extensive and advanced programming skills document the project including the process and the program	some possible programs for school use: - attendance - mark processing - school budget - accounting system - sports statistics - inventory for equipment - enrolments - graphics simulations - school labs

Prepare a Program	develop a program that reflects basic "user-friendly" criteria
	write the program in such a way that editing and modification is simplified
		some possible projects which supplement other curricular areas:
		- simulations:
		   - technical/vocational education
		   - scientific
		- modelling
		- job costing
		- scientific
		- math/statistical/probabilities

Hardware and Software Requirements	identify minimal and optimal hardware and software specifications	
Evaluate the Program	prepare an evaluation summary indicating the limitations of the program and potential problem areas make recommendations for improvements to the program	Note: If students select projects from other subject areas, there may be a need to include related objectives within the project. For example, if the student chooses to do a project involving interfacing the computer to science apparatus, the nature of the project may need to include objectives and evaluation criteria that relate to the experimental nature of the science involved.

MODULE 13: INTRODUCTION TO SECOND PROGRAMMING LANGUAGE

Status: Elective
Prerequisite: Modules 1 and 8

Purpose: To provide the student with an opportunity to study a second (high level) programming language.

Recommendation: Languages such as COBOL, Fortran, C, Pascal, or COMOL.

TOPIC	LEARNING TASKS	TEACHING NOTES
	The student will:	
Comparison of Languages	compare the advantages and disadvantages of the chosen language with other languages recognize the most suitable applications for the language	definition of High-Level Language: a language where one high-level instruction normally converts to more than one machine language instruction
Hardware/Firmware Specifications	describe the hardware/firmware specifications required for the language application	
Language Syntax	demonstrate basic knowledge of correct syntax for programming language	
Applications of the Language	write programs in the chosen high-level language	
Modification of Programs	edit/modify programs to meet specific objectives modify and debug existing programs in the chosen high-level language	
Output	demonstrate basic formatting skills in order to display and/or provide hard copy of the output	

MODULE 14: APPLICATIONS IN SECOND PROGRAMMING LANGUAGE

Status: Elective
Prerequisite: Modules 1 and 13

Purpose: To encourage the student to consolidate understanding of the syntax of the second (high-level) programming language by applying the language to a problem-solving situation.

TOPIC	LEARNING TASKS	TEACHING NOTES
	The student will:	
Application of Language	complete the study of the language commands and syntax	
Modify and Debug Programs	recode and debug programs utilizing the various language instructions	
Language Syntax	apply the proper syntax to the program contrast the syntax of this language with that of a previously-learned programming language	
Program Documentation	document the programs using techniques suitable to that language	see Appendix B of Computer Processing Course Implementation Manual for Teachers
Format Output	develop skill in formatting output using a number of different methods	control of cursor positions field width specifications decimal precision and rounding decimal alignment

MODULE 15: EXTENDED PROJECT IN SECOND PROGRAMMING LANGUAGE

Status: Elective
Prerequisite: Modules 1 and 3

Purpose: To allow the student to further demonstrate second language programming skill.

TOPIC	LEARNING TASKS	TEACHING NOTES
	The student will:	
Develop a Plan	develop a project plan that requires extensive and advanced programming skills	some possible programs for school use: - attendance - mark processing - school budget - accounting system - sports statistics - inventory for equipment - enrolments - graphics simulations - school labs
Document the Process	document the project, including the process on the program	
Program Applications	develop a program that reflects "user-friendly" criteria write the program in such a way that editing and modification is simplified	

Hardware and Software Requirements	identify minimal and optimal hardware and software specifications	some possible projects which supplement other curricular areas:
		- simulations:
		  - technical/vocational education
		  - scientific
		- modelling
		- job costing
		- scientific
		- math/statistical/probabilities
		Note:
		If students select projects from other subject areas, there may be a need to include related objectives within the project. For example, if the student chooses to do a project involving interfacing the computer to science apparatus, the nature of the project may need to include objectives and evaluation criteria that relate to the experimental nature of the science involved.

Evaluating the Program	prepare an evaluation summary indicating the limitations of the program and potential problem areas make recommendations for improvements to the program	

MODULE 16: GRAPHICS

Status: Elective
Prerequisite: Module 1

Purpose: To provide an opportunity to enrich programming skills through the development of an ability to integrate graphics and sound into programs.

Recommendation: This module should be used in conjunction with other programming modules.

TOPIC	LEARNING TASKS	TEACHING NOTES
	The student will:	
Programming Applications	expand graphics programming commands	for example, in BASIC use commands such as PLOT, POKE, and PRINT
	access and coordinate use of text and graphics windows	
	specify and manipulate vertical and horizontal lines	
Graphics Modes	distinguish between the various screen resolutions and available modes	low resolution, medium resolution, high resolution, color or monochrome
	develop various types of graphs	
	demonstrate the use of string graphics using dummy strings	
	define and explain a pixel and text and graphics windows	
	review the advanced graphics programming techniques use in an application such as games (stationary and moving targets)	
	write statements which will provide the print position for known X, Y coordinates	
	appropriately document graphics program	
	use a video display sheet to plan output output	see Appendix F of Computer Processing Curriculum Implementation Manual for Teachers
Animation	write and run a program to demonstrate animation processes	
Color Commands	explain how color can be integrated into a computer program	
	use color to differentiate objects in a graphics display	
Sound Commands	demonstrate how sound can be integrated into computer programs	

MODULE 17: SYSTEMS ANALYSIS AND PROGRAM DEVELOPMENT

Status: Elective
Prerequisite: Module 1

Purpose: To understand the factors involved in systems analysis and to develop the skills necessary to assess and solve a complex problem through the development of a computer program using a systematic approach.

TOPIC	LEARNING TASKS	TEACHING NOTES
	The student will:	
Systems Problem-Solving	describe the process required to develop a system which solves a specific problem(s)	
System Investigation	gather information relating to the existing system and problem/situation	
System Analysis	evaluate the information which respect to solving the problem identify alternative solutions to the problem	
Systems Design	design a system to solve the specific problem(s) demonstrate systems flowcharting techniques in developing designs	
Programming Techniques	design and run programs, incorporating advanced programming techniques explain the necessity for structured programming as a communication device	
Program Documentation	prepare a documentation package for each program	problem statement, flowchart, computer listing, hard copy of the output
Systems Implementation	describe the procedures used in implementing a new system research types of systems used in the business world describe measures appropriate for setting and meeting operating standards	
System Evaluation and Maintenance	outline criteria and procedures required to evaluate and maintain the system	

MODULE 18: MACHINE/ASSEMBLY LANGUAGE

Status: Elective
Prerequisite: Module 1

Purpose: To enable the student to utilize the efficiency of the machine/assembly language commands.

TOPIC	LEARNING TASKS	TEACHING NOTES
	The student will:	
Comparison of Language	compare the advantages and disadvantages of various computer languages with machine language	The reference text should be specific to the microprocessor used.
Hardware Configuration	identify machine-specific parameters and operational procedures for specific hardware	
Memory Map	modify and/or debug existing assembly language programs	
Storage Location	construct assembly language instructions in the proper format using operation, input/output, and arithmetic/logical instructions	
Assembly Language Syntax	write and run an application subroutine to enhance the feature of an existing program	
Program Modification	check the program for problems, accuracy and applicability and make appropriate improvements	
Program Applications	identify the various applications particularly suitable for machine/assembly languages demonstrate ability to use an assembler to develop a program in assembly language	

GUIDELINES FOR STUDENT EVALUATION

The business education program deals with cognitive, psychomotor, and affective learning activities.

Evaluating student achievement in these domains is a process which is based on the objectives outlined for each of the modules that have been included in the course. The teacher should determine the expectations for student achievement at the time the course is being planned. A basic guideline for determining student grades is to assign marks in proportion to the time spent on that topic and its relative importance.

If the objectives of a module are vocationally-based, the assessment should be criterion referenced; that is, how much progress has the student made toward the attainment of specific, terminal performance objectives which are generally viewed as desirable in the work place.

If the objectives of the modules are based on general interest, the assessment could be norm referenced; that is, how does the student's performance compare with that of similar groups of students in the province.

Each module includes the PURPOSE, the TOPICS and the LEARNING TASKS. PURPOSE defines the general objective for the module. TOPICS outline the concepts to be studied within the module. LEARNING TASKS reflect the depth and scope for each topic. This wording defines the expected level of understanding or skill the student should attain--MASTERY, APPLICATION, or AWARENESS.

EXPECTATIONS REGARDING CONTENT FOR STUDENT ACHIEVEMENT

MASTERY level is expected if cognitive understanding of topic/learning task is prerequisite to further success, or psychomotor activity should meet a specified standard; or

APPLICATIONS level is expected if cognitive understanding of topic/ learning task should be demonstrated or psychomotor activity should meet a specified standard; or

AWARENESS level is expected if cognitive understanding of topic/learning task requires basic understanding (comprehension) or recall (knowledge).

Teachers may modify the level of expectations (MASTERY, APPLICATION, AWARENESS) in order to ensure that the degree of challenge is suitable for the students in the class.

NOTE: Further information regarding student evaluation (i.e., justness, fairness and appeal procedures) may be found in your district's Student Evaluation Policy or Business Education Manual for Administrators, Counsellors and Teachers. In addition, the Computer Processing 10-20-30 Curriculum Implementation Manual for Teachers will include recommendations for the allocation of marks.

LEARNING RESOURCES

The basic learning resources are:

BRAUN, P. Computer Projects. Vancouver: Pacific Learning Institute, 1983. (Provides suitable support for programming component in Modules 8, 9, 10, 11. Non-programming concepts are integrated. Includes Student Guide and Teacher's Guide. Sample solution programs are available on accompanying disk.)

MCRITCHIE, M.M. Programming in BASIC: A Complete Course. (Edited by F.L. Barrett) Toronto: Holt, Rinehart and Winston of Canada Ltd., 1982. (Provides suitable support for the programming component in Modules 8, 9, 10.)

SHELLEY, G.B. and CASHMAN, T.J. Introduction to Computers and Data Processing. Fullerton, CA.: Anaheim Publishing Company, 1980. (Provides suitable support for the non-programming component in Modules 1, 8, 9, 10, 17. Appendices provide support in programming in BASIC and several advanced languages.)

The recommended learning resources are:

MCRITCHIE, M.M. Solution Manuals for Programming in BASIC: A Complete Course. Toronto: Holt, Rinehart and Winston of Canada Ltd., 1982.

SHELLEY, G.B. and CASHMAN. T.J. Student Workbook and Study Guide to Accompany Introduction to Computers and Data Processing. Fullerton, CA.: Anaheim Publishing Company, 1980. (Instructor's Guide and Answer Manual, Transparency Masters, and Test Book are available to teachers from the publisher.)

Computer Application Software:

BROWN, H.R. Touchtype. Spirit River, Alberta: Software Spirit, 1983 (suitable for Module 4).

LISSNER, R. Appleworks. Cupertino, CA.: Apple Computer Inc., 1983 (suitable for Modules 2 to 7).

LOTUS, P. Applewriter IIe. Cupertino, CA.: Apple Computer Inc., 1983 (suitable for Modules 2 and 4).

________. Bank Street Writer. New York, N.Y.: Scholastic Inc., 1982 (suitable for Modules 2 and 4).

________. *Format II Enhanced Version.* New York, N.Y.: Kensington Microware, 1982 (suitable for Module 4).

________. *Screenwriter II.* Coarsegold, CA.: Sierra On-Line Inc., 1983 (suitable for Module 4).

________. *Visicalc.* (Upgraded Version) Thornhill, Ontario: Software Arts Products, 1981 (suitable for Modules 2, 3, and 7).

CORRELATION OF COURSE CONTENT WITH LEARNING RESOURCES

Computer Processing Subject Strand

COURSE CONTENT BY MODULE	INTRO. TO COMPUTERS & DATA PROCESSING (SHELLY & CASHMAN)	PACIFIC LEARNING INST. COMPUTER PROJECTS (PETER BRAUN)	PROGRAMMING IN BASIC A COMPLETE COURSE (MARGARET MCRITCHIE)	SOFTWARE
Module 1: Computer Information Systems	Chapters 1, 2	-	-	
Module 2: Overview of Software		-	-	Appleworks Applewriter IIe Bank Street Writer Visicalc (upgraded version)
Module 3: Applications - Data Entry	Chapter 1, p. 1.16 Chapter 5, pp.5.0-5.35	Project 1		Appleworks Visicalc (upgraded version)
Module 4: Applications - Word Processing	Chapter 3, pp. 3.14-3.15 Chapters 5, 6	-		Touchtype Appleworks Applewriter IIe Bank Street Writer Format II (Enhanced version) Screenwriter II
Module 5: Applications - Business Simulation	Resources to be identified by Instructor			Appleworks
Module 6: Applications - Data Base	Chapter 9, pp.9.1-9.16			Appleworks
Module 7: Applications - Electronic Spreadsheet				Appleworks Visicalc (upgraded version)
Module 8: Overview of Introductory Programming Language	Chapters 1-3 (Selected Topics)	Projects 1, 2	Chapters 1-6 (Selected Topics)	
Module 9: Fundamentals of Input/Output		Projects 3-6		
a) Input/Output Processes	Chapter 5, pp.5.1-5.35 Chapter 6, pp.6.1-6.25		Chapter 3	
b) Processing of Data	Chapter 4, pp.4.1-4.20		Chapter 1, pp. 4-6	
c) Arrays	App. A, pp. A.30-A.36		Chapters 7, 8	
d) Library and Operating System Functions	App. A, pp. A.29-A.41 Workbook Appendix A - pp. A.1 - A.8		Chapter 9	
e) Programming Applications	Appendix A - pp. A.37, A.41, A.42 Workbook Appendix A - pp. A.9, A.10		-	
f) Data Communications	Chapter 8, pp.8.1-8.33		-	

COURSE CONTENT BY MODULE	INTRO. TO COMPUTERS & DATA PROCESSING (SHELLY & CASHMAN)	PACIFIC LEARNING INST. COMPUTER PROJECTS (PETER BRAUN)	PROGRAMMING IN BASIC A COMPLETE COURSE (MARGARET MCRITCHIE)	SOFTWARE
Module 10: Introduction to Advanced Computer Programming Techniques		Projects 7-10 (Selected Sections)		
a) Numbering Systems	Appendix C - pp. C.1-C.9		Chapter 12, pp.585-588	
b) 'Professional' Programming Techniques	Chapter 12		-	
c) Subroutines	Chapter 11		Chapter 11, pp.508-524	
d) Multiple Dimension Arrays	-		Chapter 8	
e) Introduction to Graphics	User Manual Specific to Computer			
Module 11: Advanced Computer Programming Techniques				
a) Types of Files	Chapter 7 - pp. 7.1-7.22	Projects 5-9 (Selected Sections)	-	
b) File Handling Procedures	User Manual Specific to Computer			
Module 12: Extended Programming Project	Chapter 12 - pp. 12.1-12.33	Projects 7-10 (Selected Sections)	Chapter 1, pp. 6-9	
Module 13: Introduction to Business Programming Language	-	-	-	References are specific to the programming language being taught.
Module 14: Applications in Second Programming Language	-	-	-	
Module 15: Extended Projects in Second Programming Language	Chapters 11, 12	Projects 4, 6, 7	Chapter 11, pp.508-524 Chapter 8	
Module 16: Graphics	-	-	-	Graphics references are specific to the computer used.
Module 17: Systems Analysis and Program Development	Chapters 10,11,12	Projects 4-10	Chapters 8,9,10,11,12	
Module 18: Machine/Assembly Language	Chapter 12	-	-	References are specific to the computer used.

Notes:
1. The basic resources cover the majority of the topics.
2. The above correlations are suggested as guidelines to assist in teacher planning.
3. Additional computer software packages have been identified at the supplementary level. Refer to Clearinghouse Reports.

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